

Remarks

Claims 10-27, and 30-32 are pending in this application. By the foregoing amendment, Applicants seek to amend claims 10, 19, 25, and 32, and cancel claims 28-29. These changes are believed to be fully supported by the specification and are not believed to introduce new matter. Thus, it is respectfully requested that the amendments and additions be entered by the Examiner. Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections, and that they be withdrawn.

Rejections under 35 U.S.C. § 102 and 103

At paragraph 2, claims 10, 12, 15, and 17 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5, 564,098 to Rodal. Also, claims 10, 13-20, 22-28, and 30-32 have been rejected under 35 U.S.C. §103 as being obvious over "A 3 Chip GaAs Double Conversion TV Tuner with 70 dB of image rejection" by Ducourant (hereinafter "Ducourant") in view of U.S. Patent No. 6,101, 371 to Barber. Applicants respectfully traverse based on the comments below.

Claim 10 has been amended so that the first mixer *performs up-conversion* and the second mixer performs *down-conversion*. Rodal does not teach this particular combination because both the first mixer 12 and quadrature mixers 20, 56 in Rodal perform down-conversion. (*See*, Rodal, col.3, lines 13-15, "a first mixer 12 for down-conversion to 175 MHz..."). Accordingly, claim 10 is patentable over Rodal.

Furthermore, Applicant's claim 10 recites a common substrate for both first and second mixers, and the differential filter. Whereas, Ducourant teaches three separate chips for the respective mixers and filter, so that the first and second mixers in Ducourant are *not* on the same substrate as is recited in claim 10. (*See*, Ducourant, page 88, col. 1, "Three chips have been developed....") Accordingly, claim 10 is patentable over Ducourant.

The Office Action recites Barber (US. 6,101, 371) to support the idea that a single chip radio is a widely recognized goal. This cite in Barber is referring to a generic single chip radio that does not address the specific features recited in Applicants' invention. Whereas, Applicants claim 10 recites a specific combination of features for a receiver that is not taught or suggested by the cited art. Namely, *a first mixer that performs up-conversion and a second mixer that performs down-*

conversion both on a common substrate, and a differential filter. None of the cited references, either alone or in combination, teach or suggest this particular combination of elements. Therefore, the requirements for *prima facie* obviousness are not met even if the references are combined, because they do not teach all the claim elements. (*See*, MPEP 2143)

Based on the discussion above, Applicants assert that claim 10 and their respective dependent claims 11-18 are patentable over the cited references. Claims 19-27 and 30-32 are patentable for at least the same reasons.

Claims 12 and 21 are dependent claims that further recite that the differential filter is *external to the substrate* that has the first and second mixers. These features are not taught or suggested by the cited art, so that these claims are patentable for their own respective reasons, in addition to being dependent from an allowable base claim.

Claim 25 recites a method of processing an RF signal having a plurality of channels including the step of adjusting a first local oscillator signal so that a selected channel in the plurality of channels is shifted into a passband of the differential filter. Furthermore, claim 19 has been amended so that *the steps (1), (3), and (4) are performed on a common substrate, and step (2) is performed external to the common substrate.* This particular feature is not taught or suggested by the cited references, nor does the Office Action assert this.

Claim 32 recites a first differential mixer that performs up-conversion, a second differential mixer performs down-conversion and image rejection and on a common substrate with the first differential mixer. Furthermore, a differential filter is disposed *external to the substrate.* Again, these particular feature combinations are not taught or suggested by the cited art, and therefore claim 32 is patentable over the cited art.

For at least the reasons discussed above, Applicants assert that independent claims 10, 19, 25, and 32 and their respective dependant claims are allowable over the cited references. Accordingly, Applicants request that these claims and their respective dependent claims be passed to allowance.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Version with markings to show changes made



In the Claims:

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10. (once amended) A receiver, comprising:
- a substrate;
 - a first mixer that performs up-conversion and is disposed on the substrate;
 - a differential filter coupled to an output of the first mixer; and
 - a second mixer that performs down-conversion, disposed on the substrate and coupled to an output of the differential filter.
19. (once amended) A receiver that processes a RF signal having a plurality of channels, the receiver comprising:
- a substrate;
 - a first circuit, disposed on the substrate, that [translates] up-converts the RF signal to a first IF signal;
 - a differential filter that removes at least one channel from the first IF signal;
 - a second circuit, disposed on the substrate, that performs image rejection and down-conversion and generates a second IF signal; and
 - at least the first IF signal comprising a differential signal.
25. (once amended) A method for processing a RF signal having a plurality of channels, comprising:
- (1) mixing the RF signal with a first differential local oscillator signal to produce a first differential IF signal;
 - (2) removing at least one unwanted channel from the first differential IF signal using a differential filter to produce a second differential IF signal;
 - (3) adjusting the first local oscillator signal so that a selected channel in the plurality of channels is shifted into a passband of the differential filter; and
 - (4) mixing the second differential IF signal with a second differential local oscillator signal to produce a second differential IF signal[.];

wherein steps (1), (3), and (4) are performed on a common substrate, and wherein step (2) is performed external to the common substrate.

32. (once amended) A receiver for processing a plurality of channels, comprising:

a substrate;

a first differential mixer disposed on the substrate, and that performs up-conversion;

a differential filter coupled to an output of the first differential mixer and configured external to the substrate; and

a second differential mixer, disposed on the substrate and coupled to an output of the differential filter, said second differential mixer providing down-conversion and image rejection.

Claims 28-29 have been canceled.